WHAT IS CLAIMED IS:

1. A method of assessing the life of a member subjected to a high in-service temperature for a long period comprising the steps of:

determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and a service time period during which the member is used in-service temperature, and calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member to establish data; and

approximating the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function.

2. The method according to claim 1, further comprising the step of assessing the life of the member from the in-service temperature and in-service time period, period of the member whose life is to be assessed using the approximate expression.

3. The method according to claim 1, wherein the Larson-Miller parameter P is calculated by an expression given as

$$P = (T + 273)\ (\log t + C)$$

where C is the material constant, T is the in-service temperature and t is the in-service time period, period, and the creep damage degree ϕc based upon the cumulative damage rules is calculated by an expression given as

$$P' = A(\sigma) H + B(\sigma)$$

where σ is the stress, and H is the hardness,

$$P' = (T + 273)(\log tr + C)$$

where C is the material constant, T is the in-service temperature, and tr is creep rupture life,

$$\phi c = t/(tr + t) \text{ or } \phi c = t/tr$$

where ϕc is the creep damage degree, and

where, when data of the hardness of the portion under a high in-service temperature and a high stress of the member whose life is to be assessed is used, $\phi c = t/(tr + t)$ is employed, and when data of the hardness of the portion under a high in-service temperature and a low stress is used to assess the portion of the member under a high in-service temperature and a high stress, $\phi c = t/tr$ is employed.

4. The method according to claim 3, wherein the relationship between the Larson-Miller parameter and the creep damage degree uses an approximate expression including an exponential function given as

$$\phi c = 1 - \exp(A \cdot P^B)$$

where A and B are constants.

5. A method of assessing the life of a member subjected to a high in-service temperature for a long period comprising the steps of:

determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and service time period during which the member is used in-service temperature and using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member to approximate the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function; and

estimating the creep damage degree by adding probabilistic statistical processing to the approximate expression.

6. The method according to claim 5, wherein the Larson-Miller parameter P is calculated by an expression given as

$$P = (T + 273) (\log t + C)$$

where C is the material constant, T is a service time period during which the member is used in-service temperature and t is the in-service time period, and

the creep damage degree ϕc based upon the cumulative damage rules is calculated by an expression given as

$$P' = A1(\sigma) H + B1(\sigma)$$

where σ is the stress, and H is the hardness,

$$P' = (T + 273) (\log tr + C)$$

where C is the material constant, T is the in-service temperature, and tr is the creep rupture life,

$$\phi c = t/(tr + t) \text{ or } \phi c = t/tr$$

where ϕc is the creep damage degree, and

where, when data of the hardness of the portion under a high in-service temperature and a high stress of the member whose life is to be assessed is used, $\phi c = t/(tr + t)$ is employed, and when data of the hardness of the portion under a high in-service temperature and a low stress is used to assess the portion of the member under a high in-service temperature and a high stress, $\phi c = t/tr$ is employed.

7. The method according to claim 6, wherein the relationship between the Larson-Miller parameter and the creep damage degree uses an approximate expression including an exponential function given as

$$\phi c = 1 - \exp(A \cdot P^B)$$

where A and B are constants.

8. The method according to claim 7, wherein the creep damage degree where the probabilistic statistical processing is added to the approximate expression is estimated by an expression given as

$$\phi c = \left\{1 - \exp(A \cdot P^B)\right\} \cdot \left\{\beta \cdot \sqrt[m]{\ln(1 - Pf)^{-1}}\right\}$$

where m is the Weibull coefficient, β is the scale parameter, and Pf is the cumulative probability.

9. The method according to claim 5, further comprising the step of assessing the life of the member by inputting a cumulative probability into the expression added with the probabilistic statistical processing.

10. The method according to claim 9, wherein the cumulative probability is estimated from the hardness of the member.

11. The method according to claim 10, wherein the cumulative probability Pf corresponds to the cumulative probability Pf defined by the following expression and the cumulative probability Pf depending on the hardness is obtained by an expression given as

$$Pf = 1 - \exp \{-(\mu/\beta)^m\}$$

where m is the Weibull coefficient, β is the scale parameter, and μ is the hardness of the member (experimental value)/the hardness of the member (estimated value), and

further the estimated value of the hardness of the member is obtained by an equation using the least squares method given as

$$at + b,$$

where t is the total operation time when the hardness of the member is measured, and a and b are constants.

12. The method according to claim 9, wherein the step of assessing the life provides the graph regarding the operation time of the member and the creep damage degree and the remaining life of the member.

13. A method of assessing the life of a member subjected to a high in-service temperature for a long period, wherein the hardness of the member is estimated

by an expression given as

$$H = (at + b)\,(\beta^{m}\sqrt{\ln(1 - Pf)^{-1}})$$

wherein H is the hardness of the member, t is the total operation time when the hardness of the member is measured, a and b are constants, m is the Weibull coefficient, β is the scale parameter, and Pf is the cumulative probability corresponding to the hardness of the member.

14. A method of assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated comprising the steps of:

calculating an estimation parameter which is a function of a set of the start count and thermal stress, and thermal fatigue and damage degree based on cumulative damage rules for the member whose life is to be assessed and establishing data; and

approximating the relationship between the estimation parameter and the thermal fatigue and damage degree by an approximate expression.

15. The method according to claim 14, where the estimation parameter is an exponential function, and the approximate expression showing the relationship between the estimation parameter and the thermal fatigue and damage degree is a linear equation.

16. The method according to claim 15, wherein the

estimation parameter q is given by an expression of

$$q = N\,(\sigma c \cdot nc/N + \sigma w \cdot nw/N + \sigma h \cdot nh/N)^{\alpha}$$

where α is the constant, σc is the thermal stress of the member at cold start time, σw is the thermal stress of the member at warm start time, σh is the thermal stress of the member at hot start time, N is the total start count, nc is the cold start count, nw is the warm start count, and nh is the hot start count, and

the thermal fatigue and damage degree is approximated by an expression given as

$$\phi f = Cf \cdot q$$

where Cf is a constant.

17. The method according to claim 14, further comprising the step of using the approximate expression to assess the life of the member whose life is to be assessed from the start count of the member.

18. A method of assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated comprising the steps of:

using an estimation parameter which is a function of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules, for the member whose life is to be assessed, and approximating the relationship between the estimation parameter and the thermal fatigue and damage degree by an approximate expression; and

estimating the thermal fatigue and damage degree by adding probabilistic statistical processing to this approximate expression.

19. The method according to claim 18, where the estimation parameter is an exponential function, and the approximate expression showing the relationship between the estimation parameter and the thermal fatigue and damage degree is a linear equation.

20. The method according to claim 19, wherein the estimation parameter q is given by an expression of

$$q = N\ (\sigma c \cdot nc/N + \sigma w \cdot nw/N + \sigma h \cdot nh/N)^{\alpha}$$

where α is the constant, σc is the thermal stress of the member at cold start time, σw is the thermal stress of the member at warm start time, σh is the thermal stress of the member at hot start time, N is the total start count, nc is the cold start count, nw is the warm start count, and nh is the hot start count, and the thermal fatigue and damage degree is approximated by an expression given as

$$\phi f = C \cdot q$$

where Cf is a constant.

21. The method according to claim 20, wherein the thermal fatigue and damage degree obtained by adding the probabilistic statistical processing to the

approximate expression is given by an expression of

$$\phi f = Cf \cdot q(\beta \cdot \sqrt[m]{\ln(1 - Pf)^{-1}})$$

where m is the Weibull coefficient, β is the scale parameter, and Pf is the cumulative probability.

22. The method according to claim 18, further comprising the step of assessing the life of the member by inputting a cumulative probability into the expression added with the probabilistic statistical processing.

23. The method according to claim 22, wherein the cumulative probability is estimated by the hardness of the member.

24. The method according to claim 23, wherein the cumulative probability Pf corresponds to the cumulative probability Pf defined by the following expression, the cumulative probability Pf depending on the hardness is obtained by an expression given as

$$Pf = 1 - \exp\{-(\mu/\beta)^m\}$$

where m is the Weibull coefficient, β is the scale parameter, and μ is the hardness of the member (experimental value)/the hardness of the member (estimated value), and

further the estimated value of the hardness of the member is obtained by an expression using the least squares method given as

$$at + b$$

where t is the total operation time when the hardness of the member is measured, and a and b are constants.

25. The method according to claim 22, wherein the step of assessing the life provides a graph showing relationship between the start count, and the thermal fatigue and damage degree of the member, and the remaining life of the member.

26. An apparatus for assessing the life of a member subjected to a high in-service temperature for a long period, comprising:

means for determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and a service time period during which the member is used in-service temperature, and calculating the creep damage degree on the basis of cumulative rules from the hardness and stress of the member to establish data; and

means for approximating the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function.

27. The apparatus according to claim 26, further comprising means for assessing the life of the member from the in-service temperature and in-service time period, period of the member whose life is to be assessed using the approximate expression.

28. The apparatus according to claim 26, wherein the Larson-Miller parameter P is calculated by an

expression given as

$P = (T + 273) (\log t + C)$

where C is the material constant, T is the in-service temperature and t is the in-service time period, period, and

the creep damage degree ϕc based upon the cumulative damage rules is calculated by an expression given as

$P' = A (\sigma) H + B (\sigma)$

where σ is the stress, and H is the hardness,

$P' = (T + 273) (\log tr + C)$

where C is the material constant, T is the in-service temperature, and tr is creep rupture life,

$\phi c = t/(tr + t)$ or $\phi c = t/tr$

where ϕc is the creep damage degree, and

where, when data of the hardness of the portion under a high in-service temperature and a high stress of the member whose life is to be assessed is used, $\phi c = t/(tr + t)$ is employed, and when data of the hardness of the portion under a high in-service temperature and a low stress is used to assess the portion of the member under a high in-service temperature and a high stress, $\phi c = t/tr$ is employed.

29. The apparatus according to claim 28, wherein the relationship between the Larson-Miller parameter and the creep damage degree uses an approximate expression including an exponential function given as

$\phi c = 1 - \exp(A \cdot P^B)$

where A and B are constants.

30. An apparatus for assessing the life of a member subjected to a high in-service temperature for a long period comprising:

means for determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and service time period during which the member is used in-service temperature and using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member to approximate the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function; and

means for estimating the creep damage degree by adding probabilistic statistical processing to the approximate expression.

31. The apparatus according to claim 30, wherein the Larson-Miller parameter P is calculated by an expression given as

$P = (T + 273)\ (\log t + C)$

where C is the material constant, T is a service time period during which the member is used in-service temperature and t is the in-service time period, and the creep damage degree ϕc based upon the cumulative damage rules is calculated by an expression given as

$$P' = A1(\sigma)H + B1(\sigma)$$

Where σ is the stress, and H is the hardness,

$$P' = (T + 273)(\log tr + C)$$

where T is the in-service temperature, and tr is the creep rupture life,

$$\phi c = t/(tr + t) \text{ or } \phi c = t/tr$$

where ϕc is the creep damage degree, and

where, when data of the hardness of the portion under a high in-service temperature and a high stress of the member whose life is to be assessed is used, $\phi c = t/(tr + t)$ is employed, and when data of the hardness of the portion under a high in-service temperature and a low stress is used to assess the portion of the member under a high in-service temperature and a high stress, $\phi c = t/tr$ is employed.

32. The apparatus according to claim 31, wherein the relationship between the Larson-Miller parameter and the creep damage degree uses an approximate expression including an exponential function given as

$$\phi c = 1 - \exp(A \cdot P^{B})$$

where A and B are constants.

33. The apparatus according to claim 32, wherein the creep damage degree where the probabilistic statistical processing is added to the approximate expression is estimated by an expression given as

$$\phi c = \left\{1 - \exp(A \cdot P^{B})\right\} \cdot \left\{\beta \cdot {}^{m}\sqrt{\ln(1 - Pf)^{-1}}\right\}$$

where m is the Weibull coefficient, β is the scale parameter, and Pf is the cumulative probability.

34. The apparatus according to claim 30, further comprising the step of assessing the life of the member by inputting a cumulative probability into the expression added with the probabilistic statistical processing.

35. The apparatus according to claim 34, wherein the cumulative probability is estimated from the hardness of the member.

36. The apparatus according to claim 35, wherein the cumulative probability Pf corresponds to the cumulative probability Pf defined by the following expression and the cumulative probability Pf depending on the hardness is obtained by an expression given as

$$Pf = 1 - \exp\{-(\mu/\beta)^m\}$$

where m is the Weibull coefficient, β is the scale parameter, and μ is the hardness of the member (experimental value)/the hardness of the member (estimated value), and

further the estimated value of the hardness of the member is obtained by an equation using the least square method given as

$$at + b,$$

where t is the total operation time when the hardness of the member is measured, and a and b are constants.

37. The apparatus according to claim 30, wherein

said assessing means provides the graph regarding the operation time of the member and the creep damage degree and the remaining life of the member.

38. An apparatus for assessing the life of a member subjected to a high in-service temperature for a long period, wherein the hardness of the member is estimated by an expression given as

$$H = (at + b)(\beta \cdot \sqrt[m]{\ln(1 - Pf)^{-1}})$$

wherein H is the hardness of the member, t is the total operation time when the hardness of the member is measured, a and b are constants, m is the Weibull coefficient, β is the scale parameter, and Pf is the cumulative probability corresponding to the hardness of the member.

39. An apparatus for assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated comprising:

means for calculating an estimation parameter which is a function of a set of the start count and thermal stress, and thermal fatigue and damage degree based on cumulative damage rules for the member whose life is to be assessed and establishing data; and

means for approximating the relationship between the estimation parameter and the thermal fatigue and damage degree by an approximate expression.

40. The apparatus according to claim 39, where the estimation parameter is an exponential function, and the approximate expression showing the relationship between the estimation parameter and the thermal fatigue and damage degree is a linear equation.

41. The apparatus according to claim 40, wherein the estimation parameter q is given by an expression of

$$q = N\ (\sigma c \cdot nc/N + \sigma w \cdot nw/N + \sigma h \cdot nh/N)^{\alpha}$$

where α is the constant, σc is the thermal stress of the member at cold start time, σw is the thermal stress of the member at warm start time, σh is the thermal stress of the member at hot start time, N is the total start count, nc is the cold start count, nw is the warm start count, and nh is the hot start count, and

the thermal fatigue and damage degree is approximated by an expression given as

$$\phi f = Cf \cdot q$$

where Cf is a constant.

42. The apparatus according to claim 41, further comprising means for using the approximate expression to assess the life of the member whose life is to be assessed from the start count of the member.

43. An apparatus for assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the

apparatus is being operated comprising:

means for using an estimation parameter which is a function of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules, for the member whose life is to be assessed, and approximating the relationship between the estimation parameter and the thermal fatigue and damage degree by an approximate expression; and

means for estimating the thermal fatigue and damage degree by adding probabilistic statistical processing to this approximate expression.

44. The apparatus according to claim 43, where the estimation parameter is an exponential function, and the approximate expression showing the relationship between the estimation parameter and the thermal fatigue and damage degree is a linear equation.

45. The apparatus according to claim 44, wherein the estimation parameter q is given by an expression of

$$q = N\ (\sigma c \cdot nc/N + \sigma w \cdot nw/N + \sigma h \cdot nh/N)^{\alpha}$$

where α is the constant, σc is the thermal stress of the member at cold start time, σw is the thermal stress of the member at warm start time, σh is the thermal stress of the member at hot start time, N is the total start count, nc is the cold start count, nw is the warm start count, and nh is the hot start count, and the thermal fatigue and damage degree is approximated by an expression given as

$$\phi f = Cf \cdot q$$

where Cf is a constant.

46. The apparatus according to claim 45, wherein the thermal fatigue and damage degree obtained by adding the probabilistic statistical processing to the approximate expression is given by an expression of

$$\phi f = Cf \cdot q(\beta \cdot \sqrt[m]{\ln(1 - Pf)^{-1}})$$

where m is the Weibull coefficient, β is the scale parameter, and Pf is the cumulative probability.

47. The method according to claim 43, further comprising the step of assessing the life of the member by inputting a cumulative probability into the expression added with the probabilistic statistical processing.

48. The apparatus according to claim 47, wherein the cumulative probability is estimated by the hardness of the member.

49. The apparatus according to claim 48, wherein the cumulative probability Pf corresponds to the cumulative probability Pf defined by the following expression, the cumulative probability Pf depending on the hardness is obtained by an expression given as

$$Pf = 1 - \exp\{-(\mu/\beta)^m\}$$

where m is the Weibull coefficient, β is the scale parameter, and μ is the hardness of the member (experimental value)/the hardness of the member (estimated value), and

further the estimated value of the hardness of the member is obtained by an expression using the least square method given as

at + b

where t is the total operation time when the hardness of the member is measured, and a and b are constants.

50. The apparatus according to claim 47, wherein the step of assessing the life provides a graph showing relationship between the start count, and the thermal fatigue and damage degree of the member, and the remaining life of the member.

51. A method of assessing the life of a member subjected to a high in-service temperature for a long period comprising the steps of:

determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and time of the member and using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member to approximate the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function;

prompting a terminal connected through a network to input the in-service time period, of the member whose life is to be assessed;

assessing the life of the member from the in-service time period, of the member whose life is to be assessed by using the approximate expression; and

outputting the assessed life to the terminal.

52. A method of assessing the life of a member subjected to a high in-service temperature for a long period comprising the steps of:

determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and service time period during which the member is used in-service temperature and using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member to approximate the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function and further to prepare an expression estimating the creep damage degree added with probabilistic statistical processing;

prompting a terminal connected through a network to input the in-service time period, and the hardness of the member whose life is to be assessed;

assessing the life of the member from the in-service time period and the hardness, of the input member; and outputting the assessed life to the terminal.

53. A method of assessing the life of a member subjected to a high in-service temperature for a long period comprising the steps of:

inputting a service time period during which the member is used in-service temperature, whose life is to be assessed from a terminal connected to a network; and

according to the input, in a service supplying equipment connected to the network, determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and service time period during which the member is used in-service temperature, assessing the life of the member by the approximate expression including an exponential function of the relationship between the Larson-Miller parameter and the creep damage degree using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member, and outputting the assessed life to the terminal.

54. A method of assessing the life of a member subjected to a high in-service temperature for a long period comprising the steps of:

inputting a service time period during which the member is used in-service temperature and the hardness of the member whose life is to be assessed from a terminal connected to a network; and according to the input, in a service supplying equipment connected to the network, determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and time of the member, using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member to approximate the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function and to assess the life of the member by an expression estimating the creep damage degree added with probabilistic statistical processing, and outputting the assessed life to the terminal.

55. A method of assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated comprising the steps of:

from an estimation parameter which is a function of a set of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules for the member whose life is to be assessed, preparing an approximate expression of the relationship between the estimation parameter and the thermal fatigue and damage degree;

prompting a terminal connected through a network to input the start count of the member whose life is to be assessed;

assessing the life of the member from the input start count by using the approximate expression; and

outputting the assessed life to the terminal.

56. A method of assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated comprising the steps of:

using an estimation parameter which is a function of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules for the member whose life is to be assessed and approximating the relationship between the estimation parameter and the thermal fatigue and damage degree and preparing an expression estimating the thermal fatigue and damage degree added with probabilistic statistical processing;

prompting a terminal connected through a network to input the start count and the hardness of the member whose life is to be assessed;

assessing the life of the member from the input start count and hardness by using the approximate expression; and

outputting the assessed life to the terminal.

57. A method of assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated comprising the steps of:

inputting the start count of the member whose life is to be assessed from a terminal connected to a network; and

according to the input, in a service supplying equipment connected to the network, assessing the life of the member by an approximate expression of the relationship between the estimation parameter and the thermal fatigue and damage degree, which is approximated from an estimation parameter which is a function of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules for the member whose life is to be assessed, and outputting the assessed life to the terminal.

58. A method of assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated comprising the steps of:

inputting the start count and hardness of the member whose life is to be assessed from a terminal connected to a network; and according to the input, in a service supplying equipment connected to the network, using an estimation parameter which is a function of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules, for the member whose life is to be assessed, approximating the relationship between the estimation parameter and the thermal fatigue and damage degree, assessing the life of the member by an expression estimating the thermal fatigue and damage degree added with probabilistic statistical processing, and outputting the assessed life to the terminal.

59. An apparatus for assessing the life of a member subjected to a high in-service temperature for a long period comprising:

means for determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and time of the member and using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member to approximate the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function;

means for prompting a terminal connected through a network to input the in-service time period, of the member whose life is to be assessed;

means for assessing the life of the member from the in-service time period, of the member whose life is to be assessed by using the approximate expression; and

means for outputting the assessed life to the terminal.

60. An apparatus for assessing the life of a member subjected to a high in-service temperature for a long period comprising:

means for determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and service time period during which the member is used in-service temperature and using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member to approximate the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function and further to prepare an expression estimating the creep damage degree added with probabilistic statistical processing;

means for prompting a terminal connected through a network to input the in-service time period, and the hardness of the member whose life is to be assessed;

means for assessing the life of the member from the in-service time period, of the input member; and

means for outputting the assessed life to the terminal.

61. An apparatus for assessing the life of a member subjected to a high in-service temperature for a long period, comprising:

means for inputting a service time period during which the member is used in-service temperature, whose life is to be assessed from a terminal connected to a network; and

means for according to the input, in a service supplying equipment connected to the network, determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and service time period during which the member is used in-service temperature, assessing the life of the member by the approximate expression including an exponential function of the relationship between the Larson-Miller parameter and the creep damage degree using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member, and outputting the assessed life to the terminal.

62. An apparatus for assessing the life of a member subjected to a high in-service temperature for a long period, comprising:

means for inputting a service time period during which the member is used in-service temperature and the hardness of the member whose life is to be assessed from a terminal connected to a network; and means for according to the input, in a service supplying equipment connected to the network, determining a Larson-Miller parameter for the member whose life is to be assessed from the in-service temperature and time of the member, using data established by calculating the creep damage degree on the basis of cumulative damage rules from the hardness and stress of the member to approximate the relationship between the Larson-Miller parameter and the creep damage degree by an expression including an exponential function and to assess the life of the member by an expression estimating the creep damage degree added with probabilistic statistical processing, and outputting the assessed life to the terminal.

63. An apparatus for assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated comprising:

means, from an estimation parameter which is a function of a set of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules for the member whose life is to be assessed, for preparing an approximate expression of the relationship between the estimation parameter and the thermal fatigue and damage degree;

means for prompting a terminal connected through a network to input the start count of the member whose life is to be assessed;

means for assessing the life of the member from the input start count by using the approximate expression; and

means for outputting the assessed life to the terminal.

64. An apparatus for assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated, comprising:

means for using an estimation parameter which is a function of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules for the member whose life is to be assessed and approximating the relationship between the estimation parameter and the thermal fatigue and damage degree and preparing an expression estimating the thermal fatigue and damage degree added with probabilistic statistical processing;

means for prompting a terminal connected through a network to input the start count and the hardness of the member whose life is to be assessed;

means for assessing the life of the member from the input start count and hardness by using the approximate expression; and

means for outputting the assessed life to the terminal.

65. An apparatus for assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated, comprising:

means for inputting the start count of the member whose life is to be assessed from a terminal connected to a network; and

means for according to the input, in a service supplying equipment connected to the network, assessing the life of the member by an approximate expression of the relationship between the estimation parameter and the thermal fatigue and damage degree, which is approximated from an estimation parameter which is a function of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules for the member whose life is to be assessed, and outputting the assessed life to the terminal.

66. An apparatus for assessing the life of a member provided in an apparatus which is started and stopped over and over again and subjected to a high in-service temperature for a long period while the apparatus is being operated, comprising:

means for inputting the start count and hardness of the member whose life is to be assessed from a terminal connected to a network; and

means, according to the input, in a service supplying equipment connected to the network, for using an estimation parameter which is a function of the start count and thermal stress, and data established by calculating thermal fatigue and damage degree based on cumulative damage rules, for the member whose life is to be assessed, approximating the relationship between the estimation parameter and the thermal fatigue and damage degree, assessing the life of the member by an expression estimating the thermal fatigue and damage degree added with probabilistic statistical processing, and outputting the assessed life to the terminal.

67. A computer program utilized in a computer system, comprising steps of performing the method defined in claim 5.

68. A computer program utilized in a computer system, comprising steps of performing the method defined in claim 18.